

July 22, 2013

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51.366 Data Report for 2012

Dear Brian:

Attached are the data from the northern Virginia I/M program in response to the requirements of CFR 40 Section 51.366, Data and Analysis Reporting, for calendar year 2012. We have included an explanatory narrative below. Throughout, DEQ assumes only Initial test result data are requested, unless otherwise specified.

***Narrative:***

**51.366 (a)**

For each requirement in (a), five sets of data sheets are submitted for each vehicle type entitled: all, P, T1, T2, and H. For 2012 calendar year data, for each vehicle type there is one sheet providing counts and (where applicable) one sheet providing percentages. All data are taken from the VID reporting database from which spurious and test VINs have been removed (e.g., TESTSPX ). Raw data are extracted from a contractor-provided Excel pivot table, test type by test type, and are copied to Excel summary sheets entitled 51.366 (a) (1)..., etc. where any adjustments are performed (e.g., "C" test correction – see below). These files are linked for calculation of percentages (e.g., fail rate).

**51.366 (a) (1) Number of vehicles tested by model year and vehicle type.**

A total of 826,356 vehicles received an initial I/M test or an initial remote sensing NOV or clean screen in 2012. This is an increase of 0.3% from 2011. Passenger vehicles (LDGV) comprised 56.4% of the fleet, light duty trucks up to 6,000 lbs GVWR (LDGT1) comprised 29.6%, light duty trucks 6,000 lbs to 8,500 lbs GVWR (LDGT2) comprised 12.1%, and heavy duty vehicles 8,501 – 10,000 lbs (HDGV) comprised 1.9%. The average model year for passenger vehicles was 2004.1, 2004.2 for LDGT1, 2005.1 for LDGT2 and 2003.8 for HDGV. This is a slightly newer fleet in terms of vehicle age than we had in 2011. DEQ also breaks down the number of vehicles tested by Test Type Performed. Overall, 93.6% of the IM fleet received only an OBD test, 5.1% received an ASM test, 1.0% received a TSI test and 0.3% received both an OBD and tailpipe test. A chart is provided showing the model year distribution. It is apparent that vehicle registrations fluctuate from year to year.

DEQ has had to create a "workaround" in order to determine the number of initial tests per unique vehicle. This is because the analyzer system (NVAS) allows tests off-line, which can result in multiple tests being keyed as Test Type = I for initial by the inspector. Also, a valid test result of "I" for "incomplete" is considered an initial test for purposes of receiving a free retest within 14 days, but not for purposes of evaluating initial test emissions status. As a workaround, a field, Test Type Update was created. When a record is transferred to the VID reporting database, a procedure populates the Test Type Update field based on a scan of previous existing records. This procedure should result

in only one initial test per VIN per test cycle. The Test Type Update field also provides for identifying waiver results that are duplicates or not final results (i.e., more than one waiver result per test cycle or a waiver result followed by a passing result).

In 2005, DEQ started OBD testing (phased in May through September) and in August of 2006 the On-Road Emissions (ORE) program was started. Four new Test Type Performed results were added: O = OBD, B = OBD + ASM, C = OBD + TSI, and R designating either an ORE fail with an NOV or a pass if a clean screen notice was authorized. ORE tests are valid initial tests. The "B" and "C" tests are applicable for an ORE confirmation test, wherein both an OBD test (if applicable) and a tailpipe test are required to pass.

The DEQ VID application is also able to flag certain OBD vehicles with known OBD problems to also receive a tailpipe test. We started using this feature in January 2012. Most of these vehicles received "B" tests. The VID also can trigger a random tailpipe test, which does not count towards pass/fail, for program evaluation purposes. This feature is not currently used.

For vehicle type = H, a Test Type Performed coding anomaly has occurred. OBD tests are attempted on all H vehicles but the analyzer then goes to TSI if the vehicle is shown to not be OBD compliant. In these cases, equipment software enters C for OBD + TSI instead of T for TSI. This affects the H statistics. Most of these "T" tests should have been TSI tests. Data for 51.366 (a) (1) and data in following sections have been corrected. See discussion below.

The Overall Test Result entry in column "R" indicates an On Road Emissions (ORE) test result. These can either be fail (NOV issued) or pass (Clean Screen issued). The failed remote sensing tests (NOVs) are "out of synch" in that, in general, the vehicle had already received a regular biennial IM test in the current test cycle. ORE NOVs and clean screens are tracked manually. With respect to 2012 VID query results, there were 289 "R tests" on the VID in 2012 while there were actually 332 NOVs and 194 clean screens. Thus, not all "R tests" are counted because the Test Type Update procedure may count some as retests. The "R" tests that are initial test are counted in 51.266 (a)(1) since they are an actual initial test for the purposes of determining the number of vehicles tested. Of the 289 initial "R" tests, 195 were initial pass, corresponding to a clean screen, and 96 were initial fail corresponding to an NOV. Note that in previous 51.366 reports DEQ had not counted "R" tests in the results. The difference is statistically insignificant.

**51.366 (a) (2) By model year and vehicle type the number and percent of vehicles:**

***(i) Failing initially, per test type.***

Overall 36,199 vehicles failed their initial IM test (or an "initial" ORE fail). The overall fail rate for 2012 was 4.4%. The fail rate was greatest for "H" vehicles, 6.2%, and least for "M" vehicles, 4.1%. "T" and "P" vehicles were 4.4 % and 4.4% respectively. The most prevalent (most vehicles) failing model year was 2000; the highest fail rate was 1987.

***(ii) Failing the first retest per test type.***

Overall percent of vehicles failing their first retest for 2012 was 13.6%. This is as a percent of vehicles failing their initial test. Overall percent of vehicles failing their first retest for 2012 was 16.5% as a percent of vehicles which received a first retest.

***(iii) Passing the first retest per test type.***

The overall percent of vehicles passing their first retest for 2012 was 68.7% as a percent of vehicles failing their initial test. The percentages failing and passing the first retest do not add to 100% because some vehicles never return for a retest. The overall percent of vehicles passing their first retest for 2012 was 83.5% as a percent of vehicles which received a first retest.

***(iv) Initially failed vehicles passing the second or subsequent retest per test type.***

The overall percent of vehicles passing their second or subsequent retest for 2012 was 16.4%. This is as a percent of vehicles which failed their initial test. As a percent of vehicles which received a second retest the percentage is 19.9%. These data are determined by subtracting the number of First Retest Pass in (iii) above from the number of "Last Retest Pass" (VID query name "Retest Pass"). Last Retest Pass is determined by the last passing retest record in a test cycle for each VIN.

***(v) Initially failed vehicles receiving a waiver***

A total of 502 waivers were issued in 2012. The overall waiver rate for 2012 was 1.4% as a percent of vehicles failing the initial test. The waiver rate was largest for "H" vehicles, 2.6%.

***(vi) Vehicles with no final outcome (regardless of reason)***

These are determined by subtracting the number of vehicles with known final outcome (retest pass or waiver) from the number of initial fails. VA refers to these as "retired vehicles." DEQ has determined that overall the number of retired vehicles is consistent with the number of new vehicles entering the area, considering growth. Unusual results (negative or large percentages) for a particular test type performed, vehicle type and model year may be due to a combination of small category totals combined with a few incorrect entries in vehicle type or test type performed. For example, a negative one in test type performed = "C" for OBD + TSI could indicate that one T2 vehicle failed with an initial test type = OBD + TSI but then later received a pass, with TSI only.

Using this method, 4,766 vehicles, or 13.2% of the initial fails, failed an initial test in 2012 without receiving an eventual pass or waiver. The percentages submitted are in terms of percent of initially failing vehicles. This is identical to the percentage in 2011 but is slightly higher than the 12.4% for 2008. 12.3% in 2009 and 12.3 in 2011. Although highly dependent on the fleet turnover, this percentage has generally continued to decrease since first calculated for the enhanced IM program in 1999. For the years 1999 through 2001 the average was 22%.

DEQ did an in-depth analysis of calendar year 2004 vehicles with no final outcome. This analysis used "data mining" results from an EPA audit conducted in late 2005. This audit determined that 7014 vehicles initially tested in 2004 had

no known final outcome. This was slightly larger than the total number reported in 2004 for 51.366(a)(2)(vi) which was 6,300. However the EPA audit tracked actual VINs whereas the method currently used for the 51.366 reporting is a rolling sum and difference.

In view of the above discussion, it is difficult to develop an accurate measure of “disappearing vehicles.” In 2007 DEQ implemented a VID query system to track VINs to determine final outcome. This report identifies vehicles where their last known result is a fail. In addition this report can be used to monitor the time it takes to obtain a pass result after the first failure. This report has been designed to address the EPA recommendations on the follow up of vehicles with no known final outcome. This system identifies VINs of vehicles which have failed their initial test and have not passed or received a waiver after various time periods. The system queries the DMV registration database and determines if the vehicle is, (1) De-registered, (2) registered out of the IM area in Virginia, or (3) “Outstanding.” For these outstanding vehicles the system also determines whether they have been observed by remote sensing in the IM area and the date of last observation. Using this system, for vehicles last failing in 2012, of 36,199 vehicles that failed their initial test in 2012, 4,674 were “outstanding” after 30 days. This is the sum of the number of vehicles outstanding at the end of each month in 2012. This measure seems to agree with the aggregate method described above (4,766).

It appears that vehicles take a period of time to stabilize as “outstanding.” When the status of vehicles failed after January 1, 2006 is charted in sequential months through March 2013, the percentage of “outstanding” vehicles relative to the initial failures increases from about 5% for Jan 2006 failures to about a constant 10% until January 2012 when it increases to about 15% for December 2012 failures. This indicates that a significant portion of the failures take up to 3 months to get repaired and passed or waived and some as much as a year.

A relevant consideration is whether these “outstanding” vehicles are actually being driven in the IM area. If they are not, the registration enforcement would seem to be working well even though some vehicles have not been either repaired or reported as de-registered from the IM area. Many vehicles are decommissioned without notifying DMV. The 4,674 vehicles which last failed in 2012 (not the same as initial fails in 2012) were evaluated as of March 18, 2013. Only 130 of these had been observed operating in the IM area by remote sensing after 60 days from the latest fail, and only 101 were observed driving over 120 days after the latest fail.

**(vii –x)** Not applicable

***(xi) Passing the on-board diagnostic check***

Data are queried directly from the VID query pivot table and calculations are linked to 2012 (a)(1) Number of Vehicles Per Test Type.xls for percentages minus 2012 (a)(2)(i) Initial Fail. C = OBD + TSI data have been corrected. The number of actual initial OBD passing tests is 746,950 or 96.2% overall pass rate.

***(xii) Failing the on-board diagnostic check test***

Data are taken directly from 2012 (a)(2)(i) Fail Initial for raw data and are linked to 2012 (a)(1) Number of Vehicles Per Test Type.xlsx for percentages and 2012 (a)(2)(i) Initial Fail. 29,229 vehicles failed their initial OBD test or 3.8%.

***(xiii) Failing the on-board diagnostic check and passing the tailpipe test***

The Virginia analyzer software has the capability to conduct dual testing in certain circumstances. DEQ has the ability to require that both the OBD and tailpipe test be passed for certain vehicle models by means of a flag in the vehicle lookup table. Also, OBD vehicles that fail an On-Road Emissions test are required to receive a confirmation test which includes both an OBD and tailpipe test. Currently the VID is not able to distinguish test types "B" and "C" between ORE confirmation tests and tests done on problem OBD vehicles. Therefore no data analysis has been done to determine relative tailpipe versus OBD test pass versus fail.

***(xiv) Failing the on-board diagnostic check and failing the tailpipe***

See (xiii)

***(xv) Passing the on-board diagnostic check and failing the I/M gas cap evaporative system test***

DEQ assumes EPA is requesting results of only the I/M gas cap pressure test as DEQ does not perform an evaporative system test. The percentage is calculated relative to vehicles passing the OBD test. Overall 572 or only 0.077% of the vehicles passing the OBD test failed the gas cap test. These do not include gas caps that were replaced during the test – which is allowed in Virginia so as not to require a complete new retest. Thus it accurately indicates faulty gas caps that were not detected by OBD – or perhaps a faulty gas cap pressure test.

***(xvi) Failing the on-board diagnostic check and passing the I/M gas cap evaporative system test***

The comments in (xv) apply. DEQ would like to point out that the statistics in xvi -xviii have little use. Nonetheless, 27,084 vehicles or 95.3% failed the OBD test (probably for something unrelated) while passing the IM gas cap test. The percentage is calculated relative to vehicles failing the OBD test.

***(xvii) Passing both the on-board diagnostic check and I/M gas cap evaporative system test***

The comments in (xvi) apply except percentage is calculated relative to vehicles passing the OBD test. Overall 711,543 or 95.3% of the vehicles passing the OBD test also passed the gas cap test. The percentage of (xv) and (xvii) do not total 100% because some gas caps are untestable, therefore no gas cap result is entered.

***(xviii) Failing both the on-board diagnostic check and I/M gas cap evaporative system test***

The comments in (xvi) apply. Overall 377 or 1.3% of the vehicles failing the OBD test also failed the gas cap test, a strikingly meaningless statistic. The percentages are based on the percent of vehicles failing the OBD test.

***(xix) MIL is commanded on and no codes are stored***

The percentage is calculated relative to total records with the MIL commanded on. Overall, the MIL is commanded on and DTCs are not stored for only 383 records or 1.55% of records with MIL commanded on. H vehicles 1996 to 2004 have a high percentage of MIL on with no DTCs because many of these vehicles are not fully OBD-II compliant. In VA an OBD test is started but goes to TSI if there are OBD anomalies. In this situation, they do not fail for OBD but the OBD results are logged on the record. . There were 156 of the 383 records that were H vehicles with "C" tests.

**(xx) MIL is not commanded on and codes are stored**

The percentage is calculated relative to total records with the MIL not commanded on. Overall, only 10 or 0.0015% of the records with MIL not commanded on had DTCs stored. Not a major problem!

**(xxi) MIL is commanded on and codes are stored**

The percentage is calculated relative to total records with the MIL commanded on and is equal to 1 minus the percentage calculated in (xix). The same anomalies are noted as in (xix).

**(xxii) MIL is not commanded on and codes are not stored**

The percentage is calculated relative to total records with the MIL not commanded on. Overall, 99.999% of the records with MIL not commanded on had no DTCs stored. Not a major problem!

**(xxiii) Readiness status indicates that the evaluation is not complete for any module supported by on-board diagnostic systems**

The percentage is calculated relative to total OBD initial tests. In Virginia, vehicles that have more than the allowed monitors not ready are rejected from testing. This results in an overall test result of "Abort." The number of vehicles with non-aborted not-ready status is counted and the percentage is determined relative to the number of complete OBD tests, i.e., not including those "rejected from testing." Overall 9.5% of the initial OBD tests had at least one monitor not ready. There was a significant decrease with model year 2002 and newer: 1996 – 2001 averaged 24.7% tests with at least one monitor not ready, but only 5.4% for model years 2002 - 2013. For H vehicles the percentage with at least one monitor not ready is 68.6% for model years 1996 - 2004 perhaps due to the fact that some vehicles that were not really OBD compliant. H vehicles 2005 and newer were not ready only 7.8% of initial tests.

**51.366 (a) (3) The initial test volume by model year and test station**

The data include tests back to model year 1968 for all calendar years. Virginia required testing back to model year 1968 until July 1, 2000 when the testing requirement was changed to include only vehicles 24 year old and newer. After July 1, 2000 some vehicles over 24 years old continued to receive emissions tests even though they were not required to do so. Also, vehicles back to model year 1968 are subject to the ORE program and may receive a confirmation test and retest after repairs. Data are sorted by station number and by test volume. Not all stations shown are necessarily currently active but they were active part of 2012. The test volume and average model year tested are included. This helps distinguish new testing stations and dealerships. The average number of yearly tests per station was 1516. Note that the ORE tests are categorized as having an inspection station #1928.

**51.366 (a) (4) The initial test fail rate by model year and test station**

Data are sorted by station number and by fail rate. 115 stations had an overall fail rate less than 2%. The station use code is given. Most of these stations were new car dealerships.

**51.366 (a) (5) The average increase or decrease in tailpipe emission levels for HC, CO, and NOx after repairs by model year and vehicle type for vehicles receiving mass emissions test.**

Not required of ASM programs. Also, only 6.38% of the IM fleet received a tailpipe test. Nonetheless, this data is included in terms of percentage emissions reduction. Only ASM data from pre-OBD vehicles in the regular IM program (MY 1888 through 1995) is included because very few vehicles older than 1988 or newer than 1995 received an ASM test. Data indicate that the average vehicle failing the ASM test achieved after repairs reductions of about 60% HC, 80% CO and 53% NO.

**51.366 (b) Quality assurance report**

These data are compile by the Northern Virginia compliance staff and are included in the attached sheet, 2012 (b)(c)&(d)(1)(v) Quality assurance & Quality control & Enforcement report.doc, for calendar year 2012.

Regarding Item 51.366 (b)(3)(ii) - Covert audits conducted with the vehicle set to fail any combination of two or more test types, could not be reasonably determined since two (or more) test types are currently performed only on remote sensing ORE program failures during the confirmation test. CTs are actually audited one-by-one to ensure the correct test types are performed. Doing this covertly is not possible.

**51.366 (c) Quality control report**

These data are compile by the Northern Virginia compliance staff and are included in the attached sheet, 2012 (b)(c)&(d)(1)(v) Quality assurance & Quality control & Enforcement report.doc, for calendar year 2012.

**51.366 (d) Enforcement report**

**51.366 (d) (1)(i) An estimate of the number of vehicles subject to the program including the results of an analysis of the registration database.**

DMV registration count data were taken from an annual VA DMV summary report by jurisdiction which is compiled every year on July 1 to determine the number of vehicles subject to the IM program. For 2012, DMV registration data was available by VIN. In 2011 DEQ performed a VIN decode study on VINs and found that DMV had incorrectly categorized several vehicle types, particularly LDDT. We also updated the allowance made for HDGVs over 10,000 GVWR. Using the categorization from the VIN decode, the number of vehicles subject to IM as of 7/1/2012 was 1,537,107.

**51.366 (d) (1)(ii) The percentage of motorist compliance based upon a comparison of the number of valid final tests with the number of subject vehicles.**

A comparison is given based on one-half of the vehicles registered as LDGV, LDGT1, LDGT2 or HDGV based on a VIN decode of the DMV 7/1/2012 registration run. We have not attempted to compare counts by vehicle type.

There are complications with the concept of comparing DMV registration counts with I/M initial test counts due to the transient nature of the registration database. The northern Virginia area has a more transient population than other areas. This is evidenced by the greater number of initial emission tests than registrations, particularly for vehicles 2 to 4 years old. Older model years tend to have more registrations than initial inspections. This is due to a larger proportion of older vehicles that are due to retire and vehicles that have already retired (dead records). The number of "retired vehicles" is commensurate with the number of new and used vehicles sold. Overall, the total number of initial tests for vehicles age 2 to 24 years is 99.8% of the number of registrations divided by two. In 2010 and 2011 it was 101.2%. In 2009 it was 100.4% and in 2008 it was 98.2%. This illustrates that some inspections occur outside of the registration cycle.

**51.366 (d) (1)(iii) The total number of compliance documents issued to inspection stations.**

DEQ does not issue "compliance documents" which are interpreted to be inspection stickers to the stations because VA has a registration denial system.

**51.366 (d) (1)(iv) The number of missing compliance documents**

DEQ has no "compliance documents" per se (i.e., stickers or controlled VIRs) and is not aware of any missing inspection records on the IM database.

**51.366 (d) (1)(v) The number of time extensions and other exemptions granted to motorists**

No exemptions are issued by DEQ for vehicle subject to the program. Time extensions, or "out of state deferrals," are available under certain circumstances to vehicles out of the area at the time the inspection is due. In addition Virginia DMV may issue a one time, one month temporary registration to enable a vehicle to get repairs.

Out of state deferrals issued	97
Exemption letters issued for non-conforming vehicles (NOT subject to program)	13
Exemption letters issued for overweight vehicles (NOT subject to program)	119
Exemptions issued for overweight diesel vehicles (OBD II) (NOT subject to program) (GVWR > 8,500 lbs.)	144

**51.366 (d) (1)(vi) The number of compliance surveys conducted, number of vehicles surveyed and the compliance rates found in such audits.**

No compliance surveys have been done per se. DEQ assumes EPA is referring to surveys to determine whether vehicles are operating with valid, unexpired



registrations. DEQ has relied on Virginia Dept of State Police records which have indicated that driving unregistered incidence is under 1% and DEQ has used this figure in modeling. However, DEQ gathers information in its remote sensing program that is similar to data collected in compliance surveys. For example, if a VA license plate observed through the ORE program is not recognized by DMV, this may be an unregistered vehicle. DEQ intends to investigate statistical methods to use the ORE data to identify registration compliance. DEQ welcomes EPA's suggestions on how to utilize this robust dataset.

**51.366 (d) (2) Registration denial based enforcement programs shall provide the following additional information:**

***(i) A report of the program's efforts and actions to prevent motorists from falsely registering out of the program area or falsely changing fuel type or weight on the vehicle registration, and the results of special studies to investigate the frequency of such activity.***

With respect to falsely registering out of the program area, DEQ currently identifies high emitting vehicles using the ORE program that are registered outside the IM area but are determined to be "operated primarily" inside the IM area. Similarly, vehicles observed by remote sensing that are registered with, for example, a fuel type of diesel, are still subject to the remote sensing high emitter identification program because a VIN decode is used to determine vehicle eligibility – not the DMV registration data. DEQ issues Notices of Violation (NOVs) to such vehicles and requires them to get a confirmation test and if necessary be repaired. Currently three observations are required to deem a vehicle subject to ORE if it is registered out of the IM area. Very few out-of-area vehicles meet this criterion. However, we expect the future increase in remote sensing will produce better coverage of any such vehicles (see 51.366 (e) (1)).

With respect to changing fuel type or weight on the vehicle registration, DEQ receives registration data from DMV every July 1. To the extent possible this data is analyzed to determine if vehicles are correctly registered with respect to weight and fuel. Complete analysis requires doing a VIN decode to determine correct weight and fuel. DEQ performed a complete VIN decode in fall of 2011. A summary of the results is provided below in 51.366 (d) (2)(ii).

***(ii) The number of registration file audits, number of registrations reviewed and the compliance rates found in such audits.***

ESP-Data Solutions performed a VIN decode for DEQ using VIN-Power on the VINs of vehicles registered by DMV as of 7/1/2011 in jurisdictions within Virginia. Excluded were VINs of non-powered vehicles. A detailed analysis was done on registrations within the IM area. Also, an analysis was done on VINs registered outside of Virginia, although no VIN decode data was available for these. The results were compared with the DMV

summary data which DEQ receives each July. The results are discussed below.

Some VINs did not decode. Most of these were VINS of vehicles prior to 1981. Others were probably entry errors plus a few special VINs for reconstructed vehicles. For VINs that did not decode and for vehicles registered in the IM area (and other VA ozone nonattainment or maintenance areas) DEQ used the DMV registration data to determine a Mobile6 vehicle class designation. VIN-Power does not assign a Mobile6 category to alternative fuel vehicles, so DEQ assigned a class for these vehicles as well, although they are not subject to IM in Virginia.

There were 1,874,593 such VINs in the IM area, and of these, 138 proved to be non-powered, leaving 1,874,455 which were analyzed. Of these, 22,464 were older than 1981 and an additional 4,522 did not decode with a Mobile6 class. Mobile 6 classes were assigned to these VINs based on DMV data. The total compares very closely with the DMV summary total of 1,874,577. However, the Mobile6 classes assigned by DMV differed substantially from the Mobile6 classes assigned by the VIN decode, particularly for LDT3&4 (VA uses LDT2), LDDT(1-4), and LDDV. The difference may be because DMV does not have reliable GVWR data and uses instead GVW (gross vehicle weight) which can be erroneously entered by the vehicle owner. In most cases GVW is less than true GVWR. This is reflected in the Mobile6 class differences. For example, the DMV summary classifies 19,618 vehicles as HDGV (over 8500 GVWR) whereas the VIN decode has 41,576 vehicles as HDGV. DMV also categorizes many SUVs as LDGV because they are coded as passenger carrying by DMV. Thus, DMV's classification method affects emissions modeling, and overestimates the number of vehicles subject to IM. When a vehicle is presented for inspection (due to being prompted for emissions by DMV) but does not require an inspection by virtue of GVWR or fuel, DEQ verifies the data and notifies DMV to exempt the vehicle; DMV enters a "C" in the emissions status field of the DMV record.

The VIN analysis focused on 5 possible DMV data error categories: vehicle weight, fuel, "C" emissions status, null emissions status, and out-of-state jurisdiction on the registration.

#### Vehicle Weight

DMV prompts vehicles for inspection based on weight, fuel, and vehicle type. They use the gross vehicle weight (GVW) on record or empty weight (EW) if GVW is not available. DEQ looked at records of vehicles model year 1987 – 2009 that decoded as gasoline fuel and Mobile6 classes subject to IM – i.e., gasoline powered up to 10,000 GVWR and diesel up to 8,500 GVWR. There were 3767 gasoline powered vehicles registered with a GVW > 10,000 and 2874 of these had no emissions pass or waiver in the emissions status. An additional 31 had null GVW but EW > 10,000 and 16 of these had no emissions P or W on record. In addition, the Mobile6 class HDGB VIN decode contained some vehicles <10,000 GVWR. There were 6 such vehicles with either GVW or EW >10,000 and no emissions P or W.

For LDDT vehicles 1997 and newer without an emissions test record, there was only one record with GVW > 8500 and no records with null GVW and empty weight over 8500. However, there were 44 diesel LDDT vehicles with GVWR (erroneously) on record as > 8500 and none had an emissions P or W in emissions status. Thus, it appears that DMV does use GVWR as a criterion for prompting diesels.

#### Fuel

DEQ looked at records of IM vehicles model year 1987 – 2009 that decoded as gasoline fuel but were registered as diesel. There were 221 such vehicles and of these 108 had no emissions P or W. For vehicles 1997 and newer, there were 25 with a GVW or EW less than 8501 which should have been prompted for emissions inspection. All but 2 of these had GVWR > 8500 (and 5 had emissions status = “C” – see discussion later). This indicates again that DMV is using GVWR as a criterion to prompt diesels. Generally the GVWR data on the DMV records is more accurate for diesels than gasoline vehicles.

There were also 42 vehicles registered with non-IM fuels. Some 16 were Toyota Prius or Honda Insight vehicles (DMV often has incorrect fuel type as “E” for electricity) that are exempt from IM in Virginia. However, most were DMV fuel type “C” for CNG. These vehicles were actually dual fuel, which are supposed to be tested.

#### “C” Emissions Status

When a vehicle is prompted for emissions by DMV but the vehicle is not subject to IM, DEQ notifies DMV that the vehicle is exempt and DMV enters a “C” in the emissions status field of the DMV vehicle record. DEQ keeps track of VINs for which a “C” letter was issued. In the 7/1/2012 DMV registration database there were 849 VINs with a “C” and 712 of these did not have a current emissions inspection or were not exempt from IM. 78 had a valid emissions pass or waiver. The difference, 59 vehicles had a “C” that was not issued by DEQ but were not subject to IM.

#### Null Emissions Status

Using the DMV weight selection criteria EW and GVW and GVWR < 10,000, there were still 4978 vehicles with null emissions status meaning no emissions test on the DMV record – including only model years 1987 - 2008. DEQ was able to verify that 702 of these vehicles had received a test by 9/15/2012. Nonetheless 4,226 were registered as of 7/1/2012 without an emissions pass or waiver on record. This was brought to DMV’s attention in 2012 and procedures were put in place to correct DMV practices for mail-in registration renewals. DEQ will evaluate the effect of this change starting with the July 1, 2013 DMC registration data evaluation – although it will take two years to fully rectify.

#### Out-of-state Jurisdiction

The DEQ allows registration of vehicles with garage jurisdictions outside of Virginia. DEQ used remote sensing to determine if these VINs in fact were driving in the IM area. A VIN decode was not done on the

registrations outside of VA so only VINS subject to IM using DMV fuel and weight data were investigated. There were 49,920 such vehicles registered in another state outside of Virginia (or Germany and Canada). Remote sensing data determined that only 2128 of these vehicles had been observed at least once in the IM area since January 2008. For these vehicles, DEQ determined whether more than two years had elapsed between the last emissions test pass or waiver on record and the latest date of the remote sensing observation. There were 163 vehicles seen relatively frequently, i.e., over three times, but only 46 of these were overdue on emissions inspection. There were 410 vehicles seen relatively recently (i.e., after 1/1/2011) and 188 of these were overdue for emissions. However, only 64 of the 410 were observed more than three times. It appears that most of the out-of-state jurisdiction registrations are valid but a few are not. Of the vehicles observed at least once, 96 were registered in DC, 307 in Maryland, and 28 in West Virginia.

In addition there were 604 vehicles registered as out of country or out of Virginia with no designated location and 4429 registered as MILT with no designated location. Military personnel stationed within the IM are required to conform with IM requirements and 221 of the 604 out of country and 696 of the 4429 MILT had an emissions pass on record. There is no way to know where the others are located in VA. Military staff are inherently itinerant. There does not seem to be a problem in this area.

***51.366 (e) Additional reporting requirements.***

***51.366 (e) (1) Any changes in program design, funding, personnel levels, procedures, regulations, and legal authority.***

The Virginia legislature has established expanded clean screening to be phased in up to a maximum of 30%. DEQ has finalized regulations to implement the expanded clean screen and intends to issue an RFP for the services in 2013.

***51.366 (e) (2) Any weaknesses or problems identified within the two-year period***  
none